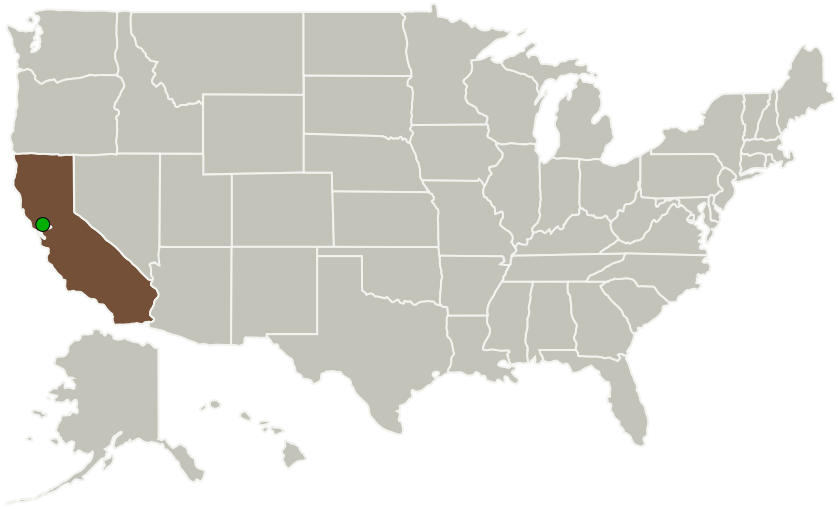
Visual Data Mining of Robot Performance Data, Phase II

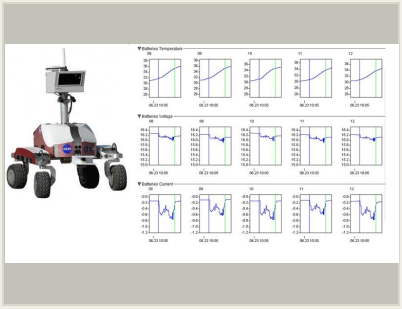
Completed Technology Project (2013 - 2015)

Project Introduction

We propose to design and develop VDM/RP, a visual data mining system that will enable analysts to acquire, store, query, analyze, and visualize recent and historical robot performance data. During mission operations, these capabilities will enable operators to more quickly and accurately detect and interpret data patterns that support or rebut candidate diagnoses or hypotheses about robot problems. During robot system development and experimentation, VDM/RP will enable analysts and robot designers to review robot test data to create and refine models that specify quantitative relationships among robot system health and status variables that hold for nominal and off-nominal modes. Key innovations include interactive arrays of timelines and graphs for visualizing multivariate, time-oriented data, temporal queries to search for significant data patterns, and intelligent assistance to simplify user selection of data, analyses, and visualizations. During Phase I, we prototyped visualizations to analyze K10 rover LIDAR scan failures. During Phase II, we will develop three successively more capable versions of VDM/RP for test usage and evaluation by NASA's Intelligent Robotics Group.

Primary U.S. Work Locations and Key Partners





Visual Data Mining of Robot Performance Data Project Image

Table of Contents

Visual Data Mining of Robot Performance Data, Phase II

Completed Technology Project (2013 - 2015)

Organizations Performing Work	Role	Type	Location
Stottler Henke Associates, Inc.	Lead Organization	Industry	San Mateo, California
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

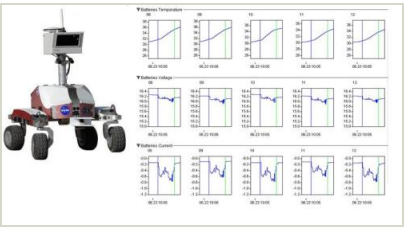
Primary U.S. Work Locations
California

Project Transitions

January 2013: Project Start

July 2015: Closed out

Images



Project Image
Visual Data Mining of Robot Performance Data Project Image *(https://techport.nasa.gov/image/132516)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Stottler Henke Associates, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

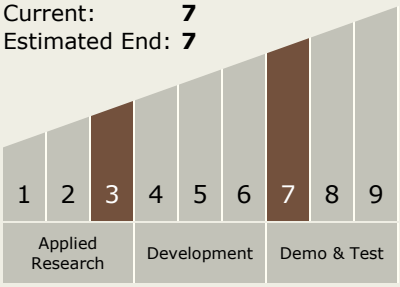
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
James C Ong

Technology Maturity (TRL)

Start: **3**
Current: **7**
Estimated End: **7**



Visual Data Mining of Robot Performance Data, Phase II

Completed Technology Project (2013 - 2015)

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.4 Human-Robot Interaction
    - TX04.4.1 Multi-Modal and Proximate Interaction

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System